

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

Releasable

1. Chemical: Linuron
2. Test Material: 95.8% active ingredient
3. Study Type: Acute Toxicity Study on a Warmwater Fish Species  
Species Tested: Bluegill sunfish  
(Lepomis macrochirus)
4. Study ID: Hall, C. (August 1985) 96-Hour LC<sub>50</sub> (Bluegill) -  
Linuron Report No. 101-85, Prepared by Haskell  
Laboratory for Toxicology and Industrial Medicine,  
Newark DE. Submitted to E.I. du Pont de Nemours  
and Co., Inc., Wilmington, DE EPA Accession  
No. 259206.
5. Reviewed by: Elizabeth E. Zucker  
Wildlife Biologist  
EEB/HED  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_
6. Approved by: Douglas Urban  
Acting Supervisory Biologist  
EEB/HED  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_
7. Conclusions:  

This study relating the acute toxicity of technical linuron to bluegill sunfish may not be used to fulfill a guidelines requirement for a 96-hour LC<sub>50</sub> test on a warmwater fish species. The test material was insoluble at all concentrations utilized, thus fish may not have been exposed to nominally designated concentrations. A reliable LC<sub>50</sub> cannot be derived.
8. Recommendations:  
N/A
9. Background:  

This study was submitted in response to guideline requirements developed by the Registration Standard for Linuron.
10. Discussion of Individual Study:  
N/A

11. Materials and Methods:

- a. Test Procedures - Fish were obtained from Sea Plantation, Inc., Salem, MA, and held in the laboratory for 96 days prior to testing. Definitive test specifics of note include:

Fish size: Mean standard length - 3.8 cm  
Mean wet weight - 1.14 g  
Diluent - Laboratory well water of 76 mg/L  
CaCO<sub>3</sub> alkalinity and 65 mL/L CaCO<sub>3</sub> hardness  
Vessels - glass, rectangular 21 liter aquaria  
containing 15 liters diluent  
Solvent - DMF (0.07 mL/L maximum)  
Ten fish per vessel  
Fish not fed 48 hours prior to testing  
Temperature - 21.8 to 22 °C  
D.O. and pH were measured in low, medium, and high  
concentrations at beginning of the test and every  
48 hours  
Mortality counts were made daily

- b. Statistical Analysis - The probit method of Finney (1971) was utilized to calculate an LC<sub>50</sub>.

12. Reported Results:

Mortality Data

Conc. (mg/L)	% Dead			
	24 hrs	48 hrs	72 hrs	96 hrs
7	0	10	30	100
5	0	0	0	40
3	0	0	0	0
2	0	0	0	0
1	0	0	0	0
0.5	0	0	0	0
Control	0	0	0	0
Solvent	0	0	0	0

D.O. ranged from 5.3 to 9.0.

pH ranged from 7.0 to 7.2.

A filmy substance occurred on the surface and sides of vessels at all levels.

At concentrations of 5 mg/L and greater, fish exhibited the following signs of toxicity: discoloration, lying on the bottom, lethargy, erratic swimming, gasping, loss of equilibrium and swimming at surface.

13. Study Author's Conclusions:

The 96-hour LC<sub>50</sub> was reported to be 5.11 mg/L.

14. Reviewer's Evaluation and Interpretation of the Study:

- a. Test Procedures - This study was performed under conditions that generally comply with current testing standards with the notable exception that a precipitate formed in all the concentrations tested.
- b. Statistical Analysis - Results of Stephan's computerized program are appended
- c. Results/Dicussions: Test material was insoluble at the concentration utilized for the study. Fish may not have been exposed to nominally designated concentrations.
- d. Adequacy of Study:
  1. Classification: Invalid
  2. Rationale: Test material was insoluble at all concentrations. A reliable LC<sub>50</sub> cannot be derived from nominally designated dosage levels.
  3. Repairability: The registrant would have to determine actual exposure concentrations.

LINURON 96 HOUR LC50 BLUEGILL

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
7	10	10	100	.0976563
5	10	4	40	37.6953
3	10	0	0	.0976563
2	10	0	0	.0976563
1	10	0	0	.0976563
.5	10	0	0	.0976563

THE BINOMIAL TEST SHOWS THAT 3 AND 7 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 5.21795

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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